

# ASSESSING THE EFFECTIVENESS OF MAINTENANCE PRACTICES IN PUBLIC SCHOOLS

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## ABSTRACT

*The Maintenance management sector in public section in Nigeria has suffered from lack of funds and negligence for a period of time. The education sector was not spare of the menace as well; huge amount of money is often invested in the provision of infrastructure in the sector while the aspect of maintenance is often neglected. Therefore in this study assessment of the effectiveness of maintenance practices in public schools was carried out using Kaduna state of Nigeria as case study. The sampling survey was limited to the existing institution. A total of eighty (80) questionnaires were administered. Eighty (80) copies of the drafted and approved questionnaires were administered with the aim of achieving the following: To assess the operational (physical-functional condition) of public schools in Kaduna state as carried out by the maintenance department. Mean item score and simple percentage was used to process the data. To examine the effectiveness of maintenance practices strategy used in maintaining the buildings. To determine the prevailing method of executing maintenance practices and study its efficiency either by direct labour or contract. To ascertain the factors that militates against. From data analysis. It was observed that lack of proper phasing of maintenance workload can give rise to uneconomical maintenance management practice. It was also observed from analysis, that some major variables lead to the inefficiency and in effectiveness of the maintenance projects includes: the occurrence of poor contract management, lack of availability of materials and the incidence of in accurate estimate.*

**KEY WORDS:** Maintenance, Practice, Effective, Assess.

## **INTRODUCTION**

Building maintenance is an important aspect of construction project management. It is so important that, reduction in resources applied to building maintenance will have a visible effect on the economy. Also, a rapid growth of housing construction is often used as an index of measuring country development and this has led to increase in the number of modern houses. As a result, more maintenance work is required in order to cope with the construction trend. Due to the growth of housing with the lack of building Standards, more maintenance, rehabilitation, and renovation work have become necessary to ensure the serviceability and safety of the constructed houses. In addition, the existing houses need to be sustained as long as possible. Therefore, method should be evolved to reduce maintenance cost. Due to the growth of housing with the lack of building Standards, more maintenance, rehabilitation, and renovation work have become necessary to ensure the serviceability and safety of the constructed houses. In addition, the existing houses need to be sustained as long as possible.

## **UNDERSTANDING THE CONCEPT OF BUILDING MAINTENANCE**

Building maintenance is an important aspect of building management that is often neglected. Maintenance assists retaining economic life of buildings. Moreover, it is an activity that requires high level of productivity at the private and the national levels. At the private level, proper maintenance leads to lower depreciation costs (due to longer economic life) and consequently leads to higher profitability. While at the national level, proper maintenance leads to lower expenditures on replacement. Thus, allowing more expenditure on expansion into new productive investment (Anderson, 1996, Lee, 1991).

The Committee on Building Maintenance in Britain defined maintenance as: "Building Maintenance is the work undertaken in order to keep, restore or improve every facility, i.e. every part of a building, its services and surrounds to a currently acceptable standard, and to sustain the utility and value of the building"(Lee 1981). In addition, maintenance is defined in the British Standards (BS 3811:1974) as "A combination of any action carried out to retain an item in, or restore it to an acceptable condition" (Lee, 1981, Brennan, 2000). A more functional definition is that "Maintenance is synonymous with controlling the condition of a building so that its pattern lies within specified regions". (Fagbenle, 1988)

Moreover, building maintenance cost can be defined as the cost of any actions carried out to retain an item in, or restore it to an acceptable condition but excluding any improvements other than those necessitated by inability to replace obsolete materials or components (Stephen, 2002, Kwang, 2005).

The Maintenance management sector in Nigeria in the public section in Nigeria has suffered from lack of funds for a period of time while the requirements for good practice in maintenance of building stock have been established over a considerable period, the achievements of good practice is by no means universal. Maintenance of the built environment impacts on the whole nation. The conditions of surrounding in which we live and learn, is a reflection of the nation's well-being "Maintainability of building has been identified as one of the key areas in which the construction industry must achieve significant improvements".

Maintaining school building in good condition through a preventive measure makes sense for academic (Oladapo 2006). However there appears to be a lack of preventive maintenance culture in general based on the various reports on the undesirable conditions of school building (Zubairu, 1999, Fielden, 1997) ).

Maintenance could also be categorised into plans and responsive could be used to determine the works that can involve the inspection of buildings, and would be used to assess the need and priority of works that would be carried out at every stage of work. Maintenance can be done in different stages. Each stage will have different characteristics

## RESEARCH METHODOLOGY

### POPULATION SAMPLING

In order to arrive at the objectives of this research work, a sample survey was carried out by the research. Random sampling was used in this study. Sampling can be defined as the selection of a group from the population to make the task of survey less expensive and more manageable. This could be achieved by selecting a small population to represent the overall population so that the research work will not become cumbersome by involving the whole population.

The sampling survey was limited to the existing institution. A total of eighty (80) questionnaires were administered. Eighty (80) copies of the drafted and approved questionnaires were administered with the aim of achieving the following; to assess the operational (physical-functional condition) of public schools in Kaduna state as carried out by the maintenance department, to examine the effectiveness of maintenance practices strategy used in maintaining the buildings, to determine the prevailing method of executing maintenance practices and study its efficiency either by direct labour or contract, to ascertain the factors that militates against efficient and effective maintenance practices of the schools.

### ANALYSIS OF DATA AND RESULTS

#### Maintenance Work Execution

In this section, results of data analysis that was retrieved from the groups of respondents was presented. Analysis on the staff and student view on maintenance practices and the technicians, responding to factors that militate against the effective and efficient maintenance practices of the schools is scheduled here.

**TABLE: 1 MAINTENANCE WORK EXECUTION RANKING**

(Staff survey)

S/N	Built asset	Most important	Important	Least important	Relative index	ranking
1.	Hostel	7	13	Nil	0.78	3 <sup>rd</sup>
2.	Senior staff qtrs.	6	14	Nil	0.76	4 <sup>th</sup>
3.	Administrative blocks	10	9	1	0.82	1 <sup>st</sup>
4.	Academic blocks	10	9	1	0.81	2 <sup>nd</sup>

From **Table 1** above, It was discovered that the administrative blocks was ranked 1<sup>st</sup> with the relative index of 0.82, meaning that the execution of maintenance works, has a great deal of attention from the maintenance department, followed by the academic blocks that was ranked 2<sup>nd</sup> with index of 0.81 on the staff survey, followed by the hostels which was ranked 3<sup>rd</sup> with index of 0.78, followed by the senior staff quarters that was ranked 4<sup>th</sup> index of 0.76 in the execution of maintenance practices.

**TABLE: 2 MAINTENANCE WORK EXECUTION RANKING**

(Student survey)

S/N	Built asset	Most important	Important	Least important	Relative index	ranking
1.	Hostel	11	14	Nil	0.81	2 <sup>nd</sup>
2.	Senior staff qtrs.	15	9	1	0.85	1 <sup>st</sup>
3.	Administrative blocks	5	18	2	0.70	4 <sup>th</sup>
4.	Academic blocks	10	9	6	0.72	3 <sup>rd</sup>

From Table 2 above, It was discovered that the senior staff quarters was ranked 1<sup>st</sup> with index of 0.85 execution of maintenance works, indicating that it also has a great deal of attention from the student perspectives of the maintenance department, followed by the hostel that was ranked 2<sup>nd</sup> with index of 0.81 on the student survey, followed by the academic blocks which was ranked 3<sup>rd</sup> with index of 0.72, followed by the administrative blocks that was ranked 4<sup>th</sup> with index of 0.70 in the execution of maintenance practices.

**TABLE: 3 MAINTENANCE WORK EXECUTION RANKING**

(technician's survey)

S/N	Built asset	Most important	Important	Least important	Relative index	Ranking
1.	Hostel	20	15	Nil	0.86	2 <sup>nd</sup>
2.	Senior staff qtrs.	24	9	2	0.88	1 <sup>st</sup>
3.	Administrative blocks	12	19	4	0.75	3 <sup>rd</sup>
4.	Academic blocks	14	16	5	0.74	4 <sup>th</sup>

From Table 3 above, It was discovered that the senior staff quarters was ranked 1<sup>st</sup> with index of 0.88 execution of maintenance works, indicating that it has a great deal of attention from the technicians response in the maintenance department, followed by the hostel that was ranked 2<sup>nd</sup> with index of 0.86 on the technicians survey, followed by the administrative blocks which was ranked 3<sup>rd</sup> with index of 0.75, followed by the academic blocks that was ranked 4<sup>th</sup> with index of 0.74 in the execution of maintenance practices.

## Approaches in Maintenance Execution

**TABLE 4** Showing the method of executing maintenance practices.

S/N	Position	Frequency	Percentage (%)
1.	Direct labour	27	37.5%
2.	In-house labour	27	37.5%
3.	Contract	22	28.9%

The methods of executing maintenance practice are presented in **Table 4** above. It was discovered that 37.5% responded to the direct labour, 37.5% also responded to In-house labour, where 28.9% responded to the idea of contract works. It could be deduced that direct labour and In-house labour was used in maintenance project execution in the selected secondary school while few projects are executed by contract.

## Factors Influencing Quality Management in Maintenance Work

**TABLE 5** Factors influencing Quality in Maintenance Work

The table below shows the general factors that are responsible for quality management of maintenance work. Relative index and ranking of every factor is presented here.

(General survey)

S/N	Factors	Strongly agree	Agree	Do not agree	No idea	Relative index	Ranking
1.	Poor contract management	39	32	5	Nil	0.86	2 <sup>nd</sup>
2.	Financing and payment of completed works	23	46	5	2	0.92	1 <sup>st</sup>
3.	Changes in site conditions	29	35	11	1	0.80	5 <sup>th</sup>
4.	Shortage of materials	16	48	12	Nil	0.76	7 <sup>th</sup>
5.	Design changes	30	37	7	2	0.81	4 <sup>th</sup>
6.	Subcontractors and nominated suppliers	17	42	14	3	0.74	9 <sup>th</sup>
7.	Weather	29	39	8	1	0.85	3 <sup>rd</sup>
8.	Labour and management relations	22	41	8	5	0.76	7 <sup>th</sup>
9.	Inspection and testing of completed portion of work	25	34	13	4	0.76	7 <sup>th</sup>
10.	Mistake during construction	26	38	8	4	0.78	6 <sup>th</sup>
11.	Construction method	19	40	14	3	0.75	8 <sup>th</sup>
12.	Price fluctuation	22	36	16	2	0.76	7 <sup>th</sup>
13.	Additional work	21	33	18	4	0.73	11 <sup>th</sup>

14.	Inaccurate estimate	22	40	10	4	0.76	7 <sup>th</sup>
15.	Delays	18	44	11	3	0.75	8 <sup>th</sup>
16.	Fraudulent practices	25	30	15	6	0.74	10 <sup>th</sup>

Results of analysis of factors influencing quality in building maintenance management was presented in this section. Financing and payment of completed works with index of 0.92 was ranked first (1<sup>st</sup>) poor contract management with relative index of 0.86 was ranked second (2<sup>nd</sup>), weather with relative index of 0.85 was ranked third (3<sup>rd</sup>) while changes in design with 0.81 index was ranked fourth (4<sup>th</sup>). Financing and payment of completed works was the most subscribed factor, poor contract management was also suggested. Issue of financing is very important if fund is not allocated to the task, the work lingers and this could lead to further deterioration.

## CONCLUSION AND RECOMMENDATIONS

### CONCLUSION

This chapter represents the findings for the research work that has been carried out. The aim of the study is to access the effectiveness of maintenance practices in public schools in Kaduna state Nigeria. As a result of creating awareness in the mind of people an easier and effective means of maintenance policies has been introduced to the community. It has been known that lack of proper phasing of maintenance workload can give rise to uneconomical maintenance management practice. It was also observed that some major variables lead to the inefficiency and in effectiveness of the maintenance projects includes: the occurrence of poor contract management, lack of availability of materials and the incidence of in accurate estimate.

As a result of creating awareness in the mind of people an easier and effective means of maintenance policies has been introduced to the community. It was observed that lack of proper phasing of maintenance workload can give rise to uneconomical maintenance management practice. It was also observed that some major variables lead to the inefficiency and in effectiveness of the maintenance projects includes: the occurrence of poor contract management, lack of availability of materials and the incidence of in accurate estimate.

### RECOMMENDATIONS

The following recommendations are put forward based on the results of this study.

- I. Adequate funds should be provided for effective maintenance practices to be achieved. The policy maker should be interested in maintenance, which should not be neglected.
- II. Maintenance practicing personnel's should acquire proper training in order to effectively execute the responsibilities required of them.
- III. Maintenance department of the schools should ensure that all the money allocated to the department, no matter how small should be used judiciously for maintenance jobs.
- IV. The need for comprehensive economic analysis and workable financial plans should be prepared before contracts are awarded.
- V. The maintenance department should ensure that there is/are a precaution to be taken to guaranty quality of materials when they are purchased for maintenance work.
- VI. The maintenance department is advised to carry out regular inspections of the existing buildings and not to wait until structure needs repairs.

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